

What is a commercial building energy code?

A commercial building energy code sets minimum building and building system requirements that are cost effective in saving energy. The energy savings translates into an energy cost savings for building owners or renters. In addition, designing better commercial buildings and building systems can yield smaller, less expensive HVAC equipment.

The primary areas usually referred to in an energy code are the building envelope, the lighting systems, and the mechanical systems. The building envelope requirements include minimum wall, roof and window insulation values. The lighting requirements include wattage requirements and controls for unoccupied hours. The mechanical system requirements include equipment efficiency requirements, controls for unoccupied hours, and duct insulation requirements.

Useful Contact Information

www.energycodes.gov—A very useful website dedicated to provide the most complete and up to date information on building energy codes across the country.

www.pnl.gov—The homepage for the Pacific Northwest National Laboratory. They generated the economic study for this project.

www.energy.gov—The Department of Energy homepage.

www.state.sd.us/puc—South Dakota's Public Utilities Commission website.

www.state.sd.us/boa/EnergyMgt.htm—The website for South Dakota's statewide energy manager.

www.ashrae.org—The source of the Series 90.1 energy codes.

South Dakota codes website—Provides a summary of the results of the project.

South Dakota's Commercial Building Energy Codes

A project by
the Energy Analysis Lab at
South Dakota State University
in cooperation with the
Governor's Office of
Economic Development



Energy Analysis Lab
Box 2219, CEH 234
Mechanical Engineering Department
Brookings, SD 57007

Phone: 605-688-4301
Fax: 605-688-5878
E-mail: eal@sdstate.edu



Project Background

The Energy Policy Act of 1992 set in motion the timeframe for all states to adopt building energy codes and the minimum requirements of the applicable code. On July 15, 2002, DOE published its determination in the Federal Register that ASHRAE/IESNA Standard 90.1-1999 "Energy Standards for Buildings Except Low-Rise Residential Buildings," would improve commercial building energy efficiency by comparing it to Standard 90.1-1989, fulfilling DOE's mandate under the Energy Conservation Policy Act, as amended. Certifications or Requests for Extension of Deadlines from each State, with regard to ASHRAE/IESNA Standard 90.1-1999, were due at DOE on or before July 15, 2004. Currently, South Dakota has no statewide, commercial building energy code, but has received an Extension of Deadlines to gain time to study the options and then move towards adopting the most applicable code.

The Energy Analysis Lab at South Dakota University instigated a study with the aim of determining the best course of action for South Dakota.

ASHRAE/IESNA Standard 90.1-1999

There are three main types of commercial building energy codes. The ASHRAE/IESNA Standard 90.1 series, the IECC series, and specifically written state codes (usually based on an ASHRAE/IESNA 90.1 series code).

ASHRAE/IESNA Standard 90.1-1999 is a comprehensive energy code covering such areas as: building envelope, HVAC, service water heating, power, lighting and other equipment. It provides the minimum requirements for the energy-efficient design of buildings except low-rise residential as prescribed by the Department of Energy.

To date, 27 states employ the series 90.1 energy code as the state minimum while 13 states reference this series. Further, the New Buildings Institute "supports that States move to ASHRAE/IESNA Standard 90.1-1999 performance levels."

Codes in South Dakota

Currently, South Dakota has no statewide commercial building energy code. They do, however, require that State buildings meet or exceed ASHRAE/IESNA Standard 90.1-1999 performance levels.

Impacts of Code Adoption

Even though there is currently no mandatory statewide energy code in South Dakota, many architectural and engineering firms design and construct commercial buildings that meet or exceed these requirements prescribed in the latest edition of ASHRAE, 90.1-2001. In general, it appears that updating the current recommended standard would have small positive impacts, both in terms of economic and energy savings for the majority of buildings conforming to our High-Efficiency prototypes.

However, there is a segment of the new commercial construction market in which many buildings are built with lower overall efficiency (Low-Efficiency buildings). For these building types--smaller offices, retail strip malls, and other small commercial buildings--the adoption of a recent ASHRAE standard would have net benefits. These benefits are most likely achieved only if the code is adopted and enforced at a local level.

Perhaps one of the most compelling arguments for considering the adoption of the updated 90.1-2001 standard would include qualitative benefits. ASHRAE Standard 90.1-2001 is written in mandatory, enforceable language, and also provides specific guidance for applying the code to existing building alterations and additions making it easier to understand and enforce. Considering that South Dakota has never had a statewide commercial building energy standard, the adoption of such a standard would clearly bring the aspect of energy efficiency into more prominence by the building community.